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Rapid determination of ^{90}Sr from ^{90}Y in Marine Fish

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Abstract: A rapid method for indirect determination of ^{90}Sr from its progeny ^{90}Y in Marine fish is developed. The method employs a fast and effective two-step co-precipitation followed by leaching ash of fish through 8M HNO_3 .Comparing conventional approach using vast fuming nitric acid, the novel co-precipitation technique removing excessive calcium of the flesh of marine fish is an environmentally friendly and sustaining procedure. And the rapid determination enables sequential measurement of ^{90}Y by both Cerenkov counting liquid scintillation assay (LSA) and gas-flow anti-coincidence shielded GM-counting. Mean chemical recovery is 60 ± 7 %. Sample preparation time is estimated to be<4 h for a set of four samples(not including ashing time). The minimum detectable concentration of ^{90}Y measured LSA techniques is 0.23 Bq kg^{-1}, for 5,17 kg mackerel and 2,5 h counting time on a liquid scintillation counter. Method performance evaluation demonstrated excellent results.

Keywords: Marine Fish, ^{90}Sr , ^{90}Y, Co-precipitation, Purification, Liquid Scintillation Assay